

REMARKS/ARGUMENTS

This is responsive to the Office Action dated April 19, 2004.

The Examiner objected to the specification. Amendments have been made in paragraph 18 in response to the Examiner's objections, which accordingly are requested to be withdrawn.

Claim 3 was rejected under 35 U.S.C. 112, second paragraph, on the ground that the term "the mover" lacked antecedent support in the previous claims. As originally filed, claim 1, line 14, recited "a mover." Therefore, this ground for rejection of claim 3 should be withdrawn.

Claims 1-8 have all been rejected as being unpatentable over the combination of WO '011, JP '698 and Kowalski et al. Claims 1, 2, 5 and 6 are being canceled. Claims 3, 4, 7 and 8 are being rewritten in independent form without any limiting or substantive changes.

Regarding claims 3 and 7, the Examiner cited Figure 3 in Kowalski et al. as disclosing a return spring 150 in a motor 10'. The spring 150 is said to return the motor shaft 28' to its home position. See col. 3, line 58 - col. 4, line 6.

The Office Action is sketchy and the Examiner's rationale in citing Kowalski's spring 150 is not completely clear. In any event, Kowalski's spring 150 is not physically combinable with the voice-coil linear actuator 26A in the primary reference, WO '011. See page 83, line 20 - page 86, line 11; page 87, lines 2-25, and Figures 24-30 in WO '011. The linear actuator 26A in WO '011 is a substantially low-friction voice-coil motor (similar to the voice-coil motor 2 disclosed herein). In contrast, the return spring 150 seems to be a compression spring that works against the friction generated by the threaded portion 50 of the shaft 28 and the threaded nut 44' in a rotary type of motor. Therefore, it appears that if Kowalski's compression spring 150 were mounted to WO '011's voice-coil motor 26A, the compression spring would continuously hold the mover and the stator of the motor 26A apart at their maximum separation, rendering the motor 26A inoperable.

In view of the foregoing, the combination of references is inappropriate, since the WO '011 patent's motor 26A is not physically combinable with the spring 150 in Kowalski. For at least this reason, the rejection should be withdrawn.

In addition, Kowalski uses its spring in a different context than the present invention and would not fairly suggest the use of a return spring as claimed in claims 3 and 7. The springs 11 herein merely support the weight of the moving parts (5, 7, 10) of the voice-coil motor 2. Thus, the claims recite: “the return spring having a spring force which is slightly greater than the sum of the weight load of a moving part of the apparatus including the mover, the suction nozzle, and the nozzle connecting shaft, and a sliding frictional force generated between the linear guide and the spline shaft.”

New claims 9 and 10 depend from claims 3 and 7 and recite that the linear actuator is a voice-coil motor. In contrast, Kowalski et al. discloses a rotary-type motor.

New claims 11 and 12 depend from claims 3 and 7 and recite that the return spring is a tension spring. In contrast, WO ‘011 discloses no spring and Kowalski et al. discloses a compression spring. These claims are also patentably distinguishable from the art of record.

Regarding claims 4 and 8, the Office Action fails to provide a prima facie basis for a rejection of these claims. There are no comments whatsoever on how WO ‘011 and Kowalski suggest the claimed invention, contrary to 37 C.F.R. §1.104(c)(2). These claims have been rewritten in independent form and should be allowed.

In more detail, claims 4 and 8 recite that “the hollow holder and the nozzle connecting shaft have a sealed chamber formed in a space therebetween; ... [the] hollow holder encircl[es] the nozzle connecting shaft with rotary bearings being interposed therebetween which allow the nozzle connecting shaft to rotate and [is] connected for being driven by a mover of the linear actuator”

In the disclosed embodiment, the hollow holder 30 surrounds and engages the nozzle connecting shaft 26 for controlling its vertical (axial) movement, while allowing it to rotate (§§38). An air port 36 is formed in the holder 30 which is for applying vacuum to a sealed chamber 34 within the holder 30. The chamber 34 communicates with an air hole 28 for applying the vacuum to an air passage 27 formed in the nozzle connecting shaft 26 (§§34, 35).

Nothing in the art suggests the claimed features, quoted above. WO ‘011 and Kowalski have no such hollow holder which both controls axial movement of the nozzle connecting shaft and has an air port and defines a sealed chamber.

Compare WO '011, third embodiment, Figures 24-30, in which the first coupling 501 controls vertical movement of the drive shaft 500, while on the other hand, the remote suction control valve 580 and other components apply the suction to the nozzle 10A. Page 84, lines 13-16.

In addition, claims 4 and 8 have been broadened so that they no longer positively claim the vacuum suction apparatus.

New claims 13-26 recite additional details of the sealed chamber and are supported by ¶34.

In view of the foregoing remarks, allowance of claims 3, 4 and 7-26 is requested.

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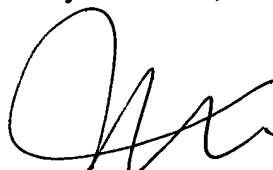
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